

WHAT IS CLAIMED IS:

1. An electron gun comprising:

an RF cavity having a first side with an emitting surface and a second side with a transmitting and emitting section; and

a mechanism for producing an oscillating force which encompasses the emitting surface and the section so electrons are directed between the emitting surface and the section to contact the emitting surface and generate additional electrons and to contact the section to generate additional electrons or escape the cavity through the section.

2. A gun as described in Claim 1 wherein said section isolating the cavity from external forces on outside the cavity and adjacent.

3. A gun as described in Claim 2 wherein the section includes a transmitting and emitting double screen.

4. A gun as described in Claim 3 wherein the mechanism includes a mechanism for producing an oscillating electric field that provides the force and which has a radial component that confines the electrons to the region between the screen and the emitting surface.

5. A gun as described in Claim 4 wherein the screen is of an annular shape.

6. A gun as described in Claim 4 wherein the screen is of a circular shape.

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7. A gun as described in Claim 4 wherein the screen is of a rhombohedrion shape.

8. A gun as described in Claim 4 including a mechanism for producing a magnetic field to force the electrons to stay between the screen and the emitting surface.

9. A method for producing electrons comprising the steps of:

moving at least a first electron in a first direction;

striking a first area with the first electron;

producing additional electrons at the first area due to the first electron;

moving electrons from the first area to a second area;

and

transmitting electrons through the second area and creating more electrons due to electrons from the first area striking the second area.